

IN THE CLAIMS:

1 1. (Currently Amended) A system for registering an object in six degrees of
2 freedom using a machine vision system comprising:
3 a search tool of the machine vision system adapted to recognize a plurality of in-
4 stances of a trained pattern, the plurality of instances each being transformed to exhibit
5 different amounts of aspect and shear and to provide a plurality of search results corre-
6 sponding, respectively, to the plurality of instances of the trained pattern; and
7 a combiner that combines the plurality of search results, wherein found relative
8 positions of the instances of the trained pattern are compared with known relative posi-
9 tions of the instances of the trained pattern so as to provide a location of the object in the
10 six degrees of freedom.

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2. (Canceled)

3. (Canceled)

4. (Canceled)

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1 ~~2.~~ (Currently Amended) The system as set forth in claim ~~1~~¹ wherein the ~~means~~
2 ~~for providing combiner~~ includes a linear transform between the expected relative position
3 of each of the instances of the trained pattern and a normalized measured position of the
4 instances of the trained pattern.

1 ~~3.~~ (Original) The system as set forth in claim 1 wherein the plurality of instances
2 of the trained pattern comprise a plurality of transposed, synthetically generated image
3 data, and the different amounts of aspect and shear are based upon predetermined known
4 increments.

4.
1 (Original) The system as set forth in claim 1 wherein the plurality of instances
2 of the trained pattern comprise a plurality of different user-specified values for aspect and
3 shear provided at runtime to the search tool so as to change an orientation of the trained
4 pattern.

5.
1 (Original) The system as set forth in claim 1 wherein the plurality of instances
2 of the trained pattern each comprise portions of an overall pattern.

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6.
1 (Currently Amended) A method for registering an object in six degrees of
2 freedom using a machine vision system comprising:
3 recognizing, with a search tool of the machine vision system, a plurality of in-
4 stances of a trained pattern, the plurality of instances each being transformed to exhibit
5 different amounts of aspect and shear;
6 providing, from the search tool, a plurality of search results corresponding, re-
7 spectively, to the plurality of instances of the trained pattern; and
8 combining the plurality of search results, including comparing found relative po-
9 sitions of the instances of the trained pattern with known relative positions of the in-
10 stances of the trained pattern so as to provide a location of the object in the six degrees of
11 freedom.

10. (Canceled)

11. (Canceled)

12. (Canceled)

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7.
1 (Currently Amended) The method as set forth in claim 12 wherein the step of
2 ~~providing aspect and shear~~ combining includes applying a linear transform between the

3 expected relative position of each of the instances of the trained pattern and a normalized
4 measured position of the instances of the trained pattern.

8.
1 ~~13.~~ (Currently Amended) The method as set forth in claim ~~11~~⁴ further com-
2 prising scoring each of the plurality of search results and selecting a best scoring of the
3 search results for combining by the step of combining.

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9.
1 ~~15.~~ (Original) The method as set forth in claim ~~9~~⁶ wherein the plurality of in-
2 stances of the trained pattern comprise a plurality of transposed, synthetically generated
3 image data, and the different amounts of aspect and shear are based upon predetermined
4 known increments.

10.
1 ~~16.~~ (Original) The method as set forth in claim ~~9~~⁶ wherein the plurality of in-
2 stances of the trained pattern comprise a plurality of different user-specified values for
3 aspect and shear provided at runtime to the search tool so as to change an orientation of
4 the trained pattern.

11.
1 ~~17.~~ (Original) The method as set forth in claim ~~9~~⁶ wherein the plurality of in-
2 stances of the trained pattern each comprise portions of an overall pattern.

12.
1 ~~18.~~ (Currently Amended) A computer-readable medium including program in-
2 structions executed on a computer for registering an object in six degrees of freedom us-
3 ing a machine vision system, the computer-readable medium including program instruc-
4 tions for performing the steps of:

5 recognizing, with a search tool of the machine vision system, a plurality of in-
6 stances of a trained pattern, the plurality of instances each being transformed to exhibit
7 different amounts of aspect and shear;

8 providing, from the search tool, a plurality of search results corresponding, re-
9 spectively, to the plurality of instances of the trained pattern; and

10 combining the plurality of search results, including comparing found relative po-
11 sitions of the instances of the trained pattern with known relative positions of the in-
12 stances of the trained pattern so as to provide a location of the object in the six degrees of
13 freedom.

19. (Canceled)

20. (Canceled)

21. (Canceled)

1 ¹⁸ 22. (Currently Amended) The computer-readable medium as set forth in claim
2 ¹⁸ 21 wherein the step of ~~providing aspect and shear~~combining includes applying a linear
3 transform between the expected relative position of each of the instances of the trained
4 pattern and a normalized measured position of the instances of the trained pattern.

1 ¹⁴ 23. (Original) The computer-readable medium as set forth in claim ¹⁸ 20 further
2 comprising scoring each of the plurality of search results and selecting best scoring of the
3 search results for combining by the step of combining.

1 ¹⁰ 24. (Original) The computer-readable medium as set forth in claim ¹⁸ 18 wherein
2 the plurality of instances of the trained pattern comprise a plurality of transposed, syn-
3 thetically generated image data, and the different amounts of aspect and shear are based
4 upon predetermined known increments.

1 ¹⁶ 25. (Original) The computer-readable medium as set forth in claim ¹⁸ 18 wherein
2 the plurality of instances of the trained pattern comprise a plurality of different user-
3 specified values for aspect and shear provided at runtime to the search tool so as to
4 change an orientation of the trained pattern.

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26. (Original) The computer-readable medium as set forth in claim 18 wherein
- 2 the plurality of instances of the trained pattern each comprise portions of an overall pat-
- 3 tern.
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